

## Report

# Digestible Solutions: A Review of Post-Consumer Food Waste at Williams College

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## Executive Summary

In recent years, work involving food waste at Williams College, such as the Cool Food Pledge and the Real Food Challenge, has focused on sustainable procurement. There has been a paucity of work dedicated to the post-consumer side of food waste, despite post-consumer waste accounting for most of the waste generated. Considering the pandemic and the increased amount of waste generated by the college, many students have been forced to think more critically about the college's waste stream and their own contributions to it. In the dining halls, a rise in single-use materials and transition towards meals to-go has diverted more waste to landfills than in years prior and revealed Williams' capability in adapting to a changing public health landscape. The upheaval brought about by COVID-19 presented an opportunity to reevaluate existing dining and waste systems in terms of sustainability and operational efficiency.

The methodology of this research project included a literature review, interviews, and a survey. We gathered resources from numerous academic journals and institutions across the globe. We specifically reviewed previous initiatives undertaken at Williams College that addressed issues of food waste and sustainability. We spoke with many faculty and staff members at Williams College that allowed us to gain an intimate understanding of food, dining, and waste operations at Williams. Interviews were conducted with Williams faculty and staff, including Assistant Director of Custodial Services and Campus Special Events, Dan Levering; Director of Dining Services, Temesgen A. Araya; Assistant Director of the Zilkha Center, Mike Evans; and Director of the Zilkha Center, Tanja Srebotnjak, among others.

## I. Survey

For our survey, we wanted to collect information that could directly inform our solutions to food waste at Williams, and we posed questions to Williams students about their habits and opinions regarding food and dining at Williams. The survey questions and structure were crafted through Google Forms under the dutiful guidance of Hana Tomozawa and Professor of Economics Sarah Jacobson, both with substantial experience in this kind of data collection. The survey was distributed through the Williams College Daily Messages,<sup>†</sup> the Economics Department newsletter, the Environmental Studies Department newsletter, and various social media messaging systems. The survey was available from January 22, 2021 until January 29, 2021, during which 232 responses were collected. The survey was structured into four sections. The first section described the survey, and asked students whether or not they had experienced dining on-campus at Williams prior to Fall 2020. These groups were then separated so that certain questions could be asked exclusively to those who had experienced dining on-campus at Williams prior to Fall 2020. The second section asked these students about their opinions and preferences on food and dining. The third section asked students about their habits related to food and dining. The fourth section gathered information on the demographics of our respondents and included an open response section where survey participants could write suggestions or comments about policies regarding food waste.

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<sup>†</sup> Daily Messages is a daily email sent to students, staff, and faculty at Williams that contains a variety of Williams-related content.

Some results that depict the habits and opinions of students regarding waste might be skewed favorably because of social desirability bias, which can make some students respond with answers that they think would be perceived as more “socially desirable” [1]. In this case, “socially desirable” behaviors might include composting all of one’s food waste or picking up all meals that are ordered to-go. Additionally, the survey was partially distributed through different newsletters and email listservs that specifically target Environmental Studies students and students interested in sustainability. Due to the demographics, it is possible that our survey responses are skewed towards results that show a more sustainable student body or are more critical of the existing infrastructure regarding food waste.

## II. Results

Out of the 232 responses for the survey, 179 respondents (77.2%) indicated that they had experienced dining on-campus at Williams prior to the Fall 2020 semester. 193 respondents (83.2%) were enrolled on-campus for Fall 2020, with the remaining respondents indicating that they were enrolled remotely, abroad, off-campus, or said they did not enroll this semester. The demographics of participants are as follows:

Class Year  
232 responses

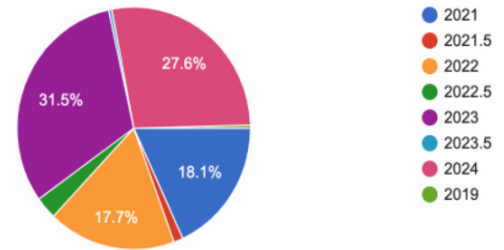


Chart 2: Class year of survey respondents

For Fall 2020, what was your enrollment status?  
232 responses

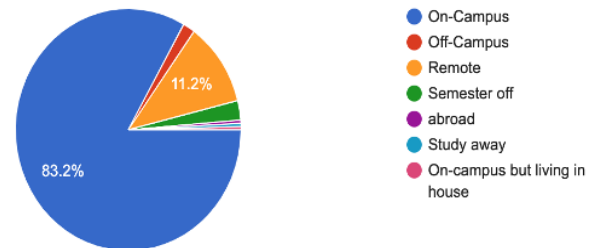


Chart 3: Enrollment status of survey respondents for Fall 2020 semester

Do you play a varsity sport?  
232 responses

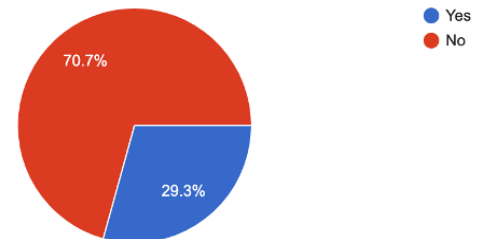
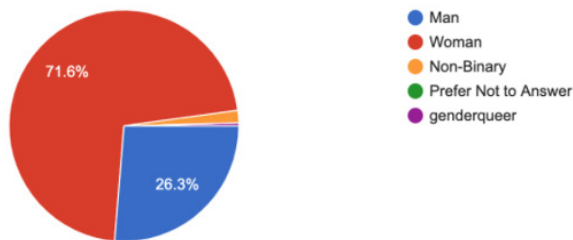


Chart 4: Percentage of survey respondents who play varsity sports

Questions meant to survey student habits in dining were not distributed to all participants. We wanted information from some questions to exclusively come from students who had experienced dining on-campus at Williams prior to Fall 2020 because such information would inform our study of dining with a mind toward a post-COVID situation. However, some questions were asked to all participants because they pertained to COVID-specific policies and were exclusively relevant to Fall 2020 dining. Additionally, most questions asked to all participants were required except for questions that were open responses.

Chart 1: Self-identified gender of survey respondents

Gender  
232 responses



For those that had experienced dining on-campus prior to Fall 2020, we asked them how many times they ate their meals in/around the dining halls. 133 respondents (74.3%) said they ate their meals 2-3 times a day on average, with only 8 respondents (4.5%) saying they ate none of their meals in/around the dining halls.

How many times a day on average do you eat your dining hall meals in/around the dining halls?  
179 responses

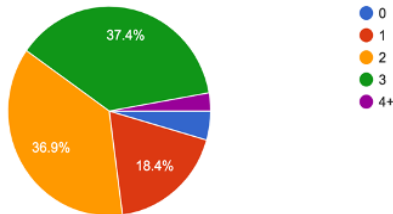


Chart 5: Frequency of students eating meals in/around the dining halls

In response to a question of the number of times dining hall meals were taken to-go, a plurality (47.5%) said they took 1 meal to-go on average each day, with 58 respondents (32.7%) saying they took no meals to-go and the rest of the respondents saying they took at least 2 meals to-go per day.

How many times a day on average do you take your dining hall meals to go?  
179 responses

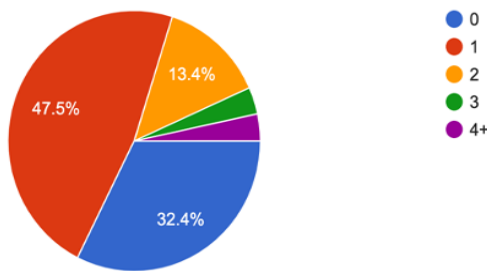


Chart 6: Frequency of students taking to-go meals

When asked how many times per week respondents ordered a meal in advance, 96 respondents (41%) answered ordering an average of 0-3 times a week while 90 respondents (39%) said they ordered an average of 4-7 times a week. We also asked how many times per week respondents ordered a meal and did not pick it up, and we received 188 responses (81%) indicating zero instances and 8 responses (3%) indicating 1 instance on average a week. Dining unit manager

Charlotte Clark noted that there were approximately 25-40 meals that were not picked up each night for the final six weeks of the Fall 2020 semester. We asked respondents to identify the primary reasons they end up with leftover food, presenting a list of reasons to choose. Most respondents listed “I did not like the food” as one of their reasons, and “The food is low quality” as well as “I served myself too much” were widely selected as well, while a mere 12 respondents indicated that they “never waste food”.

When asked how often they disposed of leftover food into the compost bins near the clearing stations within dining halls, 127 respondents (70.9%) said they always disposed of their waste into the compost bins.

If you eat in the dining hall, how often do you dispose of your leftover food and food waste in the compost bins next to the dishes?  
179 responses

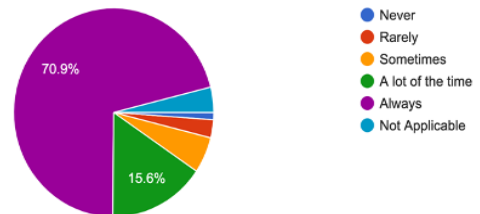


Chart 7: Frequency of composting meals when inside the dining halls

We asked the participants how much food they had left from their dine-in meal on average, and 158 respondents (88.3%) indicated having at least “a little” food left over, with 53 (29.6%) answering “some” and 13 (7.9%) having “a lot” of food left over. Only 16 respondents (8.9%) said they had “none” of their food left from their dine-in meals, on average.

Regarding to-go meals, only 37 respondents (20.7%) said they always disposed of their waste into compost bins. Compared to dine-in meals, the proportion of respondents that finished their to-go meals entirely was greater, with 45 participants (25.1%) answering “none” of their food was left from their to-go meals on average.

If you take your food to-go, how often do you compost the remaining food and food waste?  
179 responses

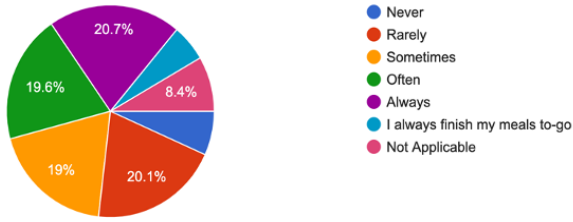


Chart 8: Compost frequency of meals to-go

A series of questions aimed to gauge student attitudes surrounding dining halls and waste processes were directed at all survey participants, regardless of whether or not they experienced dining on-campus prior to Fall 2020. When asked to rate the quality of Williams food on a scale of 1 to 5, with 1 being extremely low quality and 5 being extremely high quality, 125 respondents (54%) rated the food a 3 while 71 respondents (31%) rated the food a 4.

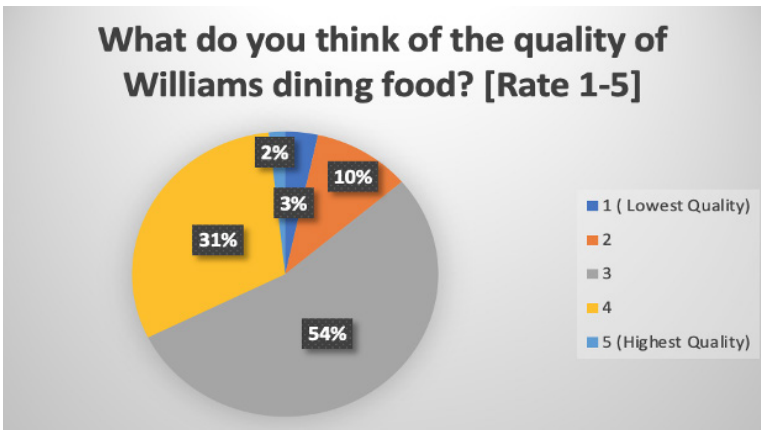


Chart 9: Opinions on quality of dining hall food

When asked about the accuracy of the following statement, “I have a close relationship with the dining staff”, 66 respondents (28%) somewhat disagreed, 58 (25%) respondents were indifferent, and 53 (23%) respondents somewhat agreed.

The respondents were also asked about the accuracy of the statement, “Waste disposal containers are accessible and available at dining halls”, and received 92 (40%) responses somewhat agreeing with the statement and 86 responses (37%) strongly agreeing.

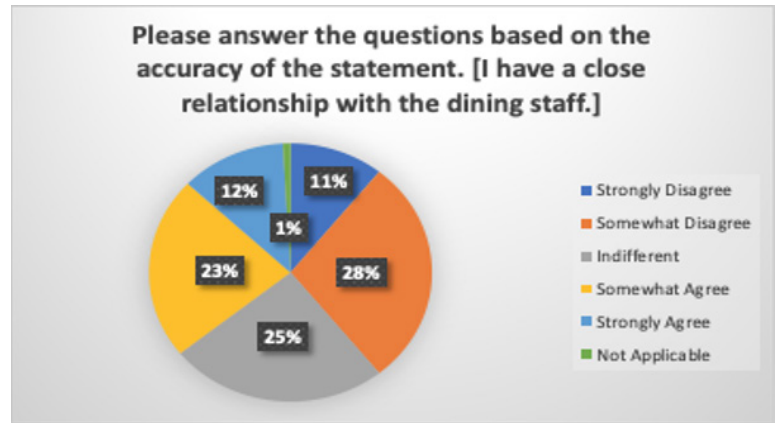


Chart 10: Relationships between dining staff and students

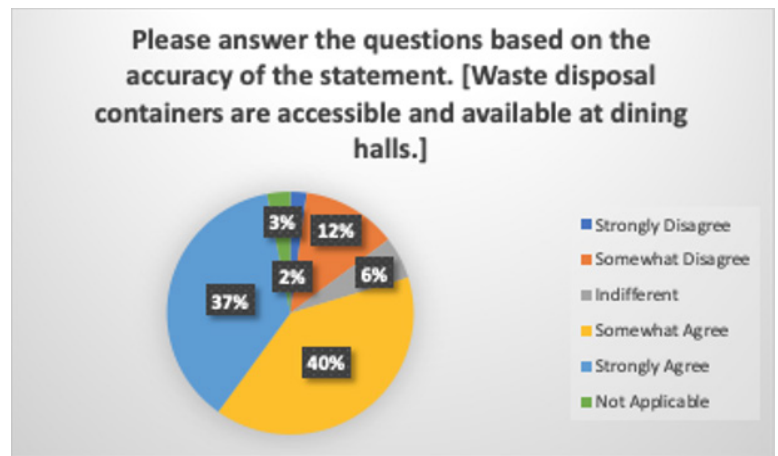


Chart 11: Accessibility and availability of waste disposal containers in dining halls

Respondents were asked the same question about waste disposal containers in their residence, with 72 (31%) respondents strongly agreeing, 65 respondents (28%) somewhat agreeing, and 47 (20%) somewhat disagreeing.

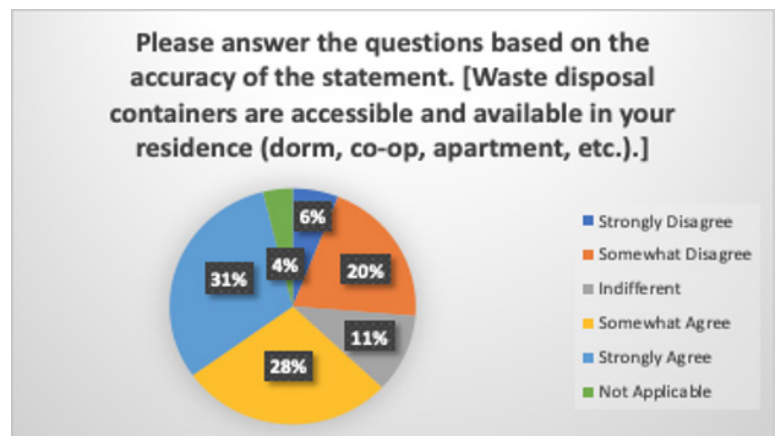


Chart 12: Accessibility and availability of waste disposal containers in residences

Regarding the clarity of composting instructions inside of dining halls, 85 (37%) respondents strongly agreed that instructions were clear, 68 respondents (29%) somewhat agreed that instructions were clear, and 32 respondents (14%) somewhat disagreed that instructions were clear.

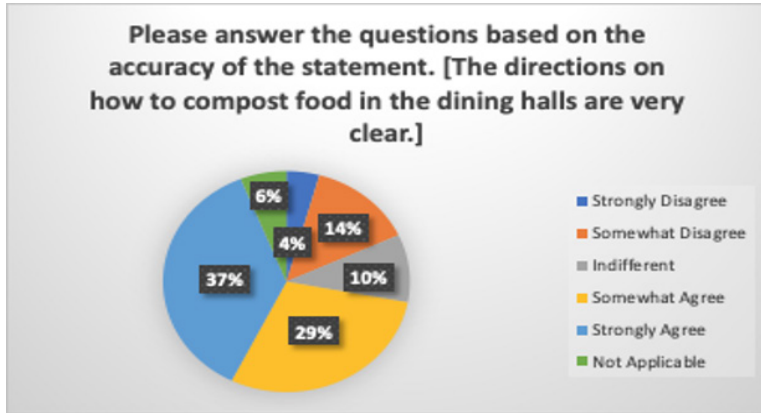


Chart 13: Opinions on composting directions inside of dining halls

Respondents were asked the same question about composting instructions outside of dining halls, with 68 respondents (29%) somewhat disagreeing that instructions were clear, 51 respondents somewhat agreeing (22%) that instructions were clear, and 43 respondents (18%) strongly agreeing that instructions were clear.

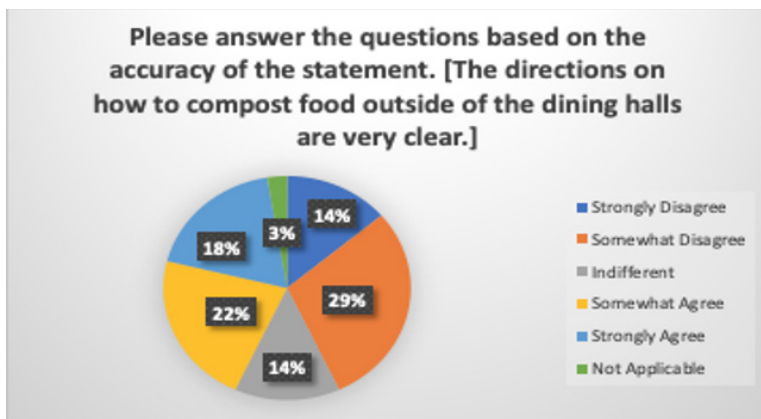


Chart 14: Opinions on composting directions outside of dining halls

At the conclusion of our survey, the participants were given an optional question asking if they had any ideas on how to address food waste or improve upon existing policies at

Williams regarding food waste. 94 answers were received from the 232 participants (40.5%) with a number of trends standing out. The most popular idea, by far, was a call for more compost bins across campus. The desired locations ranged from within the dorms to outside the dining halls, but 32 responses (34.0%) made requests for more compost bins. Requests to revert to self-serving in the dining halls, or at least for dining staff to serve smaller portions, received 23 responses (24.5%). Due to the COVID-19 pandemic, health protocols barred self-serving in the buffets, and instead, dining staff served the students. Clearer composting directions, as well as improved education regarding composting and waste separation received 22 responses (23.4%). The responses ranged from calls for clearer signage to increased transparency on the composting process at Williams. Others suggested improving food quality, incorporating student preferences into menu designs, inculcating a culture of sustainability within the student body, expanding the capacity of Williams Recovery of All Perishable Supplies (WRAPS), information on recommended serving sizes, and reforming the meal-swipe buffet system entirely.

### III. Discussion

Responses indicated a disparity between the proportion of people who always compost their dine-in meal (70.9%) versus those who always compost their to-go meal (20.7%). This result aligns with variable student accessibility to compost bins depending on campus location. Although there are compost bins directly adjacent to the area that students put their used dishware inside the dining halls, student comments indicated lack of clear directions or access to compost bins outside of the dining halls (i.e. outdoors and inside the dorms). If students took fewer meals to-go, there may be an increase in the rate of compost disposal, though, due to mobile ordering and busy schedules, this change may be difficult to implement. Additionally, further measures could be taken to expand composting directions and access across Williams' campus. To-go meals are often not composted because outdoor and dorm composting bins are often not clearly marked or easily accessible to students. This finding is

supported by the open responses from our survey in which 54 responses (57.4 %) either called for better composting directions or more compost bins. The details and limitations of such policies are explored in our “Recommended Solutions” section.

Consumers are subconsciously motivated to fill the dishware in front of them with food, so if dishware in the dining halls at Williams were reduced, students might end up eating an amount of food they can finish completely [2]. Smaller dishware might reduce the amount of unfinished dine-in meals, and consequently the amount of to-go meals. Coupled with the option of refilling one’s plate within seconds, students would still be able to eat however much they like. Ideally, as little food as possible would end up in trash and compost bins, so reducing dishware sizes could have a significant financial benefit for the college in addition to the positive environmental consequences. According to Mike Evans of Facilities, waste management and transportation costs are calculated by weight, so decreasing the amount of food discarded will directly affect waste management costs.

With regards to student culture and the social space that food service occupies, the survey results indicate a number of issues that could be addressed. When asked whether they had a close relationship with dining hall staff, 64% of respondents in the sample either disagreed or were indifferent to the question. Furthermore, the majority of students cited a dislike for the food (76% of respondents) and the surprisingly low quality (48% of respondents) as the two primary reasons for ending up with food waste. Greater facilitation of relationships between the student body and dining services, as well as a strengthening of communication around students’ individual food preferences must be a priority going forward.

#### **IV. Recommended Solutions**

Although we ultimately detail a variety of solutions that fall under the following three categories: “education”, “disposal”, and “operations”, we recommend the following four going forward. Section IV: “Recommended Solutions” outlines these recommendations in greater detail and includes an evaluation of the solutions not included as final recommendations.

##### **IV.i Information Campaign**

We propose a two-prong informational campaign. The first piece aims to address students’ relationship with food on campus. A number of sources pointed to a lack of connection between consumers and the food production process as a major cause of food waste [3]. This informational campaign would highlight dining hall workers or possibly local food producers, mimicking the popular blog “Humans of New York” by presenting the stories of subjects alongside a genuine portrait. Perhaps revealing the faces behind the food will encourage students to think more critically about the time and resources that went into the making of their meals.

The second piece of our informational campaign would be a food waste competition utilizing a constantly-updating bulletin. Students would compete as a whole to achieve an amount of food waste below a certain level, perhaps last year’s waste level, and the administration could reward the student body with a prize, such as a pizza party.

##### **IV.ii Orientation**

Orientation for first-year students at Williams, known as First Days, is an incredibly formative time. Students are introduced to their fellow classmates, the campus culture, campus traditions, and how to live as a college student. While Root exists as one medium through which students can learn about sustainability, as well as social justice, it is only one of many EphVentures that are offered, with most students electing to do other orientation activities such as WOOLF. Adapted from Ashley Amos’ “A Greener Freshman,” we believe including sustainability education in First Days would inform students about how to behave sustainably during their time on campus as well as build a culture of sustainability into the DNA of Williams students [4].

Sustainability education could come in many different forms throughout First Days. Junior Advisors (JAs) are heavily involved in the frosh’s experience during First Days and are responsible for administering the bulk of dorm-specific education, as well as facilitating student mingling. The JAs could conduct group activities

where the frosh can learn about sustainability on campus. This could be in the form of a poster-making session, or perhaps a scavenger hunt to locate the proper disposal receptacles. The JAs could host informational sessions with the frosh to go over sustainable behavior. Additionally, the JAs' behavior and habits can act as models for the frosh. Incorporating sustainability education into JA training could ensure that the JAs demonstrate sustainable behavior for the frosh to imitate. Class-wide activities could also be tailored to educate the frosh on sustainability at the college and could supplement work from the JAs in inculcating a culture of sustainability.

#### IV.iii Clean Plate Club

Dining hall food disposal lines are often congested and frustrating for students who don't have food to dispose of, particularly around peak dining times. Adapted from alumni Eleanor Lustig's "Reducing Post-Consumer Wastefulness," The "Clean Plate Club" would expedite the disposal process for students with no food waste, allowing them to drop off their serveware at an additional cart in the disposal area and exit the dining hall quickly [1].

The cart should be clearly visible, so the act of returning serveware to the cart might be a social signal. Also, the cart should be placed in the proximity of the entrance, so the presence of the dining attendant might disway students looking to subvert the honor system. Students have volunteered as "Composting Buddies" in the past to educate their peers about composting etiquette, and their responsibilities could be expanded to address students using the additional cart.

#### IV. iv Reduce Plate Size

Although many aspects of the food choice environment influence how much food a student deems as the "appropriate amount", studies have shown plate size to be one of the most important factors in determining food intake [5]. Given that a plate replacement in Driscoll dining hall is forthcoming, we recommend that the college reduces the size of their plates across all three dining halls. Unexplored by higher education institutions, for a more cost-effective solution to

address the effects of plate-size on food intake, the college may develop an informational campaign in conjunction with dining services, informing students of the psychological link between plate-size and food intake.

In addition to the four solutions that we have recommended, we also discuss a sustainability course requirement, liquid waste diversion, expanding mobile ordering, and more frequent, focused data collection. We decided not to include them for a variety of reasons, mainly due to difficulties in viable execution, especially when compared to their projected impact on food waste and sustainability.

#### V. Conclusion

We hope this project contributes to a multi-dimensional culture of sustainability at Williams College. In addition to envisioning new ways the college can mitigate their negative environmental effects, Williams students are influenced by the curriculum and on-campus, direct experiences to become environmental stewards in their post-graduate life. By illustrating multifaceted responses from students, staff, faculty on food waste and sustainability across different time periods, our survey showed the poor quality of student-dining staff relationships, student desire for expanded outdoor composting and more detailed composting instructions, the discrepancy between to-go food waste and dine-in food waste during COVID, and student's perceived negative impact of self-service on food waste. In the same way that prior student work heavily informed this endeavor, we hope that our piece helps lay the groundwork for future student efforts in sustainability and food waste.

#### VI. Appendix: Survey Questions

##### *Section 1. Students that Experienced In-person Dining Prior to Fall 2020*

- What do you think of the quality of Williams Dining food? [rate 1-5]
- Rate the Williams Mobile app [rate 1-5]

- Please answer the questions based on how strongly you agree with the statement [Strongly Disagree, Somewhat Disagree, Indifferent, Somewhat Agree, Strongly Agree, Not Applicable]
  - The Williams Mobile app is accurate in displaying meal options.
  - I have a close relationship with the dining staff.
  - Waste disposal containers are accessible and available at dining halls.
  - Waste disposal containers are accessible and available in your residence (dorm, co-op, apartment, etc.).
  - The directions on how to compost food in the dining halls are very clear.
  - The directions on how to compost food outside of the dining halls are very clear.
  - How many times a day on average do you eat your dining hall meals in/around the dining halls? [0, 1, 2, 3, 4+]
  - How many times a day on average do you take your dining hall meals to go? [0, 1, 2, 3, 4+]
  - How many times per week do you order meals in advance (Fall 2020)? [0-3, 4-7, 8-11, 12-15, 16+]
  - How many times per week do you order a meal and not pick it up? (Fall 2020)? [0, 1, 2, 3, 4+]
  - If you eat in the dining hall, how often do you dispose of your leftover food and food waste in the compost bins next to the dishes? [Never, Rarely, Sometimes, A lot of the time, Always, NA]
  - On average, how much of your dine-in meal is left when you are finished eating? [None, A little, Some, A lot, Most, NA]
  - If you take your food to-go, how often do you compost the remaining food and food waste? [ Never, Rarely, Sometimes, Often, Always, I always finish my to-go meals, NA]
- How many times per week do you order a meal and not pick it up? [0, 1, 2, 3, 4+, NA]
- What meal plan are you currently on? [14, 21, no meal plan]
- How many unused meal swipes do you have on average per week? [0-2, 3-5, 6+, NA]
- When you end up with leftover food, what is usually the reason? [The food is low quality, I'm in a rush to finish eating, I served myself too much, I never waste food, I did not like the food]

## References

[1] E. Lustig, "Reducing Post-Consumer Wastefulness: Collecting Compostable Cups and Introducing the Clean Plate Club." " Williams College, May 19, 2015.

[2] B. Wansink and K. Van Ittersum, "Portion size me: Plate-size induced consumption norms and win-win solutions for reducing food intake and waste," *Journal of Experimental Psychology: Applied*, vol. 19, no. 4, p. 320, 2013.

[3] J. Aschemann-Witzel, I. De Hooge, P. Amani, T. Bech-Larsen, and M. Oostindjer, "Consumer-related food waste: Causes and potential for action," *Sustainability*, vol. 7, no. 6, pp. 6457-6477, 2015.

[4] A. Amos, "A Greener Freshman: Encouraging Sustainable Practices in the Freshmen Class," Williams College, May, 2009.

[5] S. S. Holden, N. Zlatevska, and C. Dubelaar, "Whether smaller plates reduce consumption depends on who's serving and who's looking: a meta-analysis," *Journal of the Association for Consumer Research*, vol. 1, no. 1, pp. 134-146, 2016.

## *Section 2. Students that have not Experienced In-Person Dining Prior to Fall 2020*

- How many times per week do you order meals in advance? [0-3, 4-7, 8-11, 12-15, 16+]